

What is claimed are:

1. A DC power source device comprising at least one switching element which performs the intermittent switching operation for converting DC power input from a DC power supply into high frequency electric power; a control circuit for turning the switching element on and off; and a rectifying smoother for converting the high frequency electric power through the switching element into a DC power output supplied to a load;

the control circuit comprising an output current controller for controlling the on-off term of the switching element to make DC output current through the load settle toward a rated value; a reference voltage source for receiving drive current supplied from the rectifying smoother and producing a reference voltage to regulate the rated value of the DC output current determined by the output current controller; and a drive current controller for keeping the drive current through the reference voltage source on a substantially constant level.

2. The DC power source device of claim 1, wherein the output current controller comprises a current detector for detecting DC output current through the load; a comparator for comparing detection output from the current detector and the reference voltage from the reference voltage source to produce a first or second output signal when the current detector produces the detection output respectively lower or higher than the reference voltage of the reference voltage source; and a drive signal generator for producing drive signals to control the on-off period of the switching element so as to make the DC output voltage supplied to the load settle toward a constant value or decline when the comparator produces respectively the first or second output signal.

3. The DC power source device of claim 2, wherein the drive current controller comprises an output voltage detector for detecting output voltage from the rectifying smoother; a voltage comparator for generating a first or second output signal when the output voltage detector detects the output voltage respectively higher or lower than a threshold voltage; and a current adjuster for supplying the reference voltage source with the drive current from the rectifying smoother or the drive current plus an auxiliary drive current when the voltage comparator produces respectively the first or second output signal.

4. The DC power source device of claim 3, wherein the current adjuster comprises a rectifying element and a resistor connected in series between the voltage comparator and the reference voltage source to supply the auxiliary drive current through the rectifying element and the resistor to the reference voltage source.

5. The DC power source device of claim 3, wherein the current adjuster comprises a switch means which is turned on when the voltage comparator produces the second output signal to supply the reference voltage source with the auxiliary drive current.

6. The DC power source device of claim 3, wherein the drive current controller comprises a plurality of voltage comparators which are assigned threshold voltage values different from each other to change the value of the auxiliary drive current supplied to the reference voltage source through the current adjuster by second output signals generated from the voltage comparators.

7. The DC power source device of claim 6, wherein each voltage comparator is connected in series to the reference voltage source (24) through rectifying elements and resistors; and the current adjuster supplies the reference voltage source with different drive currents when each of the voltage comparators produces the second output signal.

8. The DC power source device of claim 6, wherein the current adjuster comprises a plurality of switch means each which is turned on when the voltage comparators produce the second output signals to supply the reference voltage source with the different drive currents.

9. The DC power source device of any one of claims 3, 5, 6 and 8, wherein the current adjuster comprises a means for preventing reverse current flow.